GE
Intelligent Platforms

GRA112

3U VPX High Performance Graphics Board

Features

- NVIDIA® EXK107 GPU
  - NVIDIA Kepler architecture
  - 384 processor cores
  - 128-bit memory bus
  - 2 Gbytes GDDR5 SDRAM
  - As used on NVIDIA GT 650M
- PCI Express
  - 16-lane PCIe Gen 3 capable (x16/x8/x4~~/x1~~)
- Support
  - NVIDIA CUDA™ (compute capability 3.0)
  - OpenCL™
  - OpenGL
  - GPUBoost
  - NVIDIA H.264 video encoding (NVENC)
  - NVIDIA PureVideo® Technology (PUHD)
  - NVIDIA PhysX™ -ready
  - Microsoft® DirectX (Compute)
- Dual channel output
  - 2x digital DVI outputs
  - Up to WUXGA (1920 x1200) @ 60 Hz
  - 2x analog outputs
  - Up to UXGA (1600 x1200) @ 60 Hz
  - Legacy video, STANAG 3350, RS-170
- Air- and conduction-cooled variants
- 3U VPX form factor
- Available as 2LM VPX-REDI

The GRA112 is the third generation of 3U VPX graphics boards, bringing the NVIDIA 'Kepler' graphics processing unit to the rugged military and aerospace market for both video and graphics generation and general purpose computing (GPGPU).

For both runtime performance and ease of programming, NVIDIA's EXK107 GPU enables significant gains in SIGINT, radar and video or image processing applications. With 384 processing cores, single- and double-precision floating point units, improved shared memory architecture and cache hierarchy, together with faster atomic operations, the GRA112's EXK107 GPU is capable of CUDA Compute Capability v3.0.

GE Intelligent Platforms GRA112's 3U VPX form factor allows maximum bandwidth connectivity between NVIDIA's EXK107 GPU and the system backplane, routing the full 16 lanes of PCI Express® Gen 3 to the backplane for connection to a CPU, such as a 3rd generation Intel® Core™ i7 SBC. This high-bandwidth interconnect helps reduce latency, particularly in applications which transfer large volumes of data to the GPU for processing.

Designed to be pin-compatible with GE's GRA111, the GRA112 offers two independent graphics channels in both analog VESA and digital DVI formats. In addition, the analog outputs can be configured to drive legacy video formats such as STANAG 3350 and RS-170, with custom timings if

This high-performance graphics card is available in all five of GE's standard rugged build levels, from benign lab environments to wide-temperature rugged conduction-cooled, and in a two-level maintenance (2LM) VITA 48-REDI variant with rear covers. In critical applications where it is desirable to have a fast shutdown of computing equipment, an option exists for a fast power-supply discharge.

The GRA112 is a form, fit and function replacement for the GRA111, and may be deployed in the MAGIC1 Rugged Display Computer to provide a fast-to-market solution for high-performance graphics and GPGPU signal processing applications.

The GRA112 is optionally available as an LRM (Line Replaceable Module) in accordance with the VPX-REDI (VITA 48) standard

3U VPX High Performance Graphics Board

Specifications

GPU
- NVIDIA EXK107

Video memory
- 2 GB GDDR5 SDRAM
- 128-bit wide memory interface

Number of channels
- Dual independent channels

RGB output
- VESA resolutions up to 1920x1200 @ 60 Hz
- STANAG 3350 A, B, C; RS-170; Custom

Digital output
- DVI 1.0 resolutions up to 1920x1200 @ 60 Hz

Form factor
- 3U OpenVPX

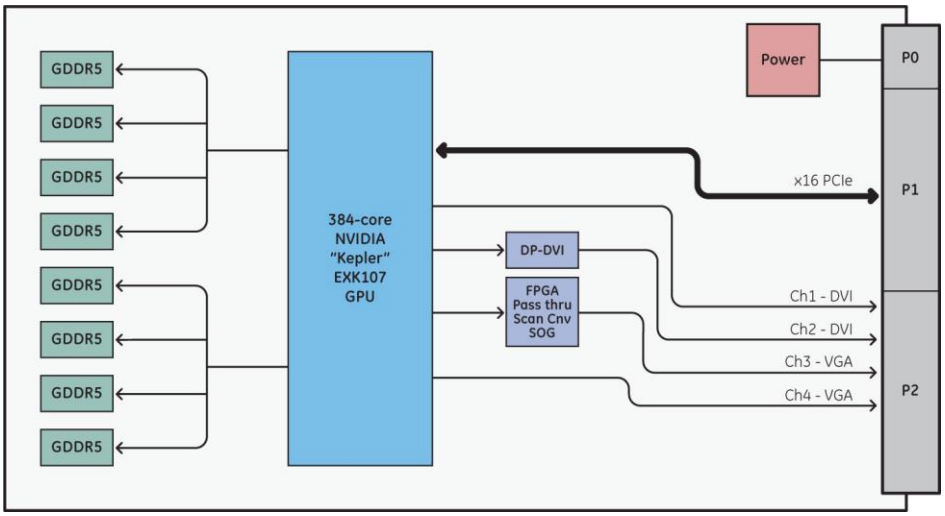
Fabric Interface
- Interconnection between GPU and CPU
- 16-lane PCI Express interface, Gen 3 capable

Environment
- Level 1: 0°C to +55°C air-cooled
- Level 2: -20°C to +65°C air-cooled
- Level 3: -40°C to +75°C air-cooled
- Level 4: -40°C to +75°C conduction-cooled
- Level 5: -40°C to +85°C conduction-cooled

Drivers
- OpenGL 4.1 and DirectX 11 drivers for Microsoft Windows & Linux running on Intel host card

Power Requirements
- +5V / 3V3_Aux required

Block Diagram



Ordering Information

GRA112 – 1 0 0 0 0 0 3 3U VPX Graphics Board

- 3: 1 = 0.8" Pitch, VITA 46; 3 = 1" Pitch, VITA 46
- 0 = Video BIOS - Maximum performance
- 0 = Reserved
- 0 = Reserved
- 0 = Reserved
- 0 = Reserved
- 1: 5 = Level 5: -40°C to +85°C conduction-cooled; 4 = Level 4: -40°C to +75°C conduction-cooled; 3 = Level 3: -40°C to +75°C air-cooled; 2 = Level 2: -20°C to +65°C air-cooled; 1 = Level 1: 0°C to +55°C air-cooled

GRA111RTM-103 Single Width Rear Transition Module
GRA111RTM-113 Dual Width Rear Transition Module

About GE Intelligent Platforms

GE Intelligent Platforms is a division of GE that offers software, control systems, services, and expertise in automation and embedded computing. We offer a unique foundation of agile and reliable technology providing customers a sustainable competitive advantage in the industries they serve, including energy, water, consumer packaged goods, oil and gas, government and defense, and telecommunications. GE Intelligent Platforms is headquartered in Charlottesville, VA. For more information, visit defense.ge-ip.com.

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